

Title: dull1 CODING FOR A NOVEL
STARCH SYNTHASE AND USES THEREOF
Inventor Name: Alan M. Myers et al.
Appl. No. UnAssigned
Docket No.: ISU-003BX

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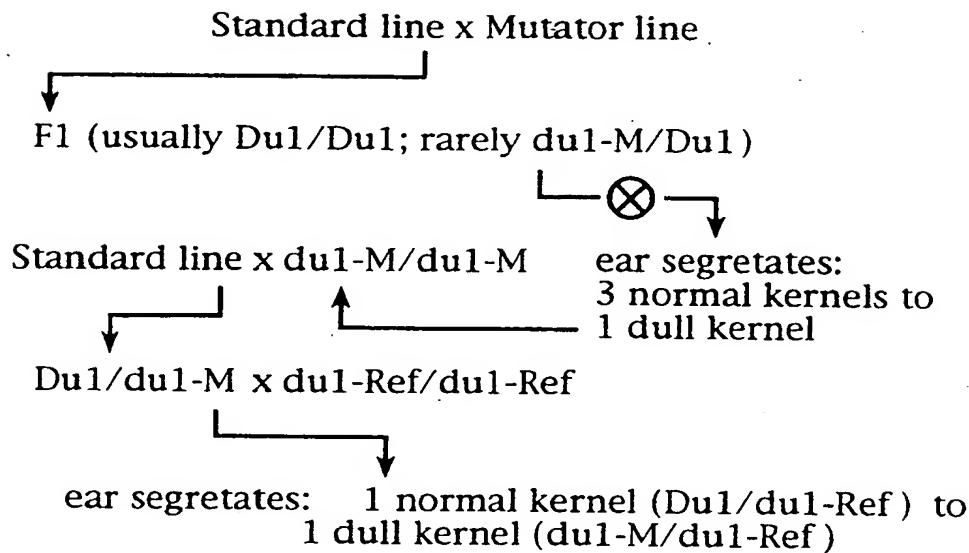


FIGURE 1A

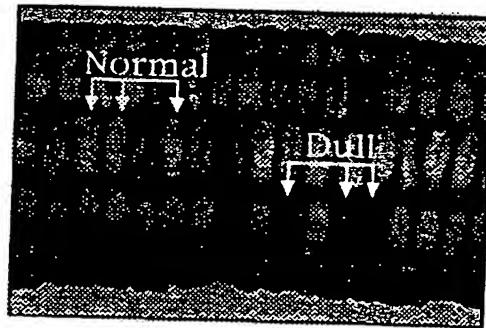


FIGURE 1B

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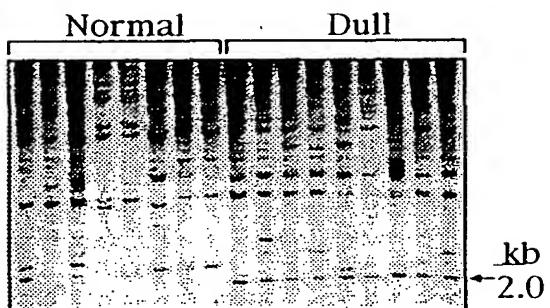


FIGURE 2A



FIGURE 2B

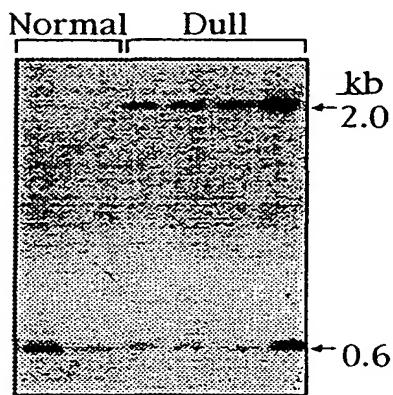


FIGURE 2C

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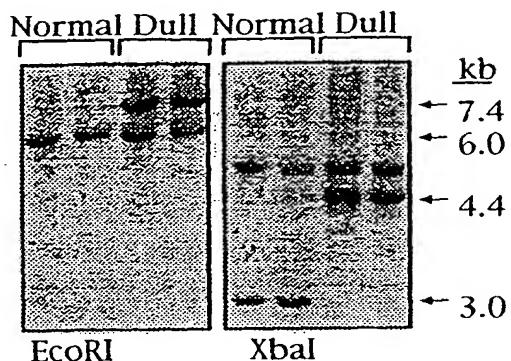


FIGURE 3A

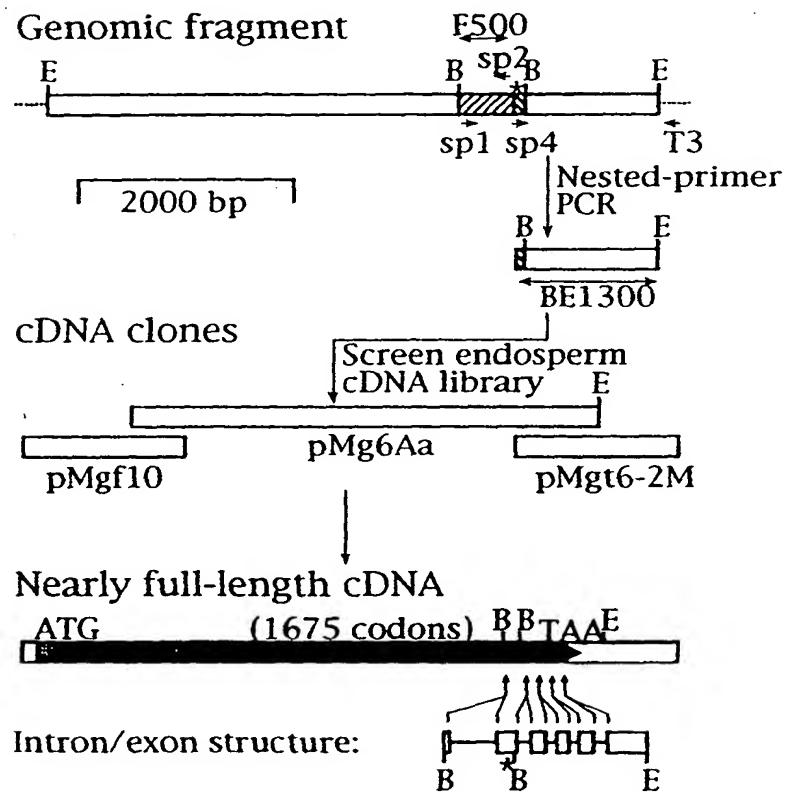


FIGURE 3B

Title: dull1 CODING FOR A NOVEL
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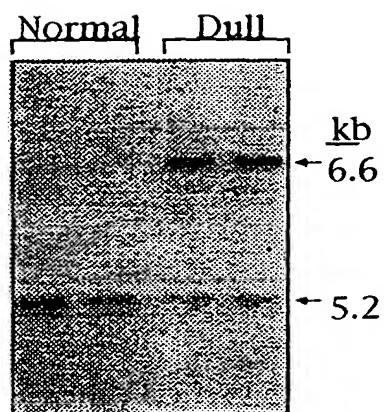


FIGURE 4

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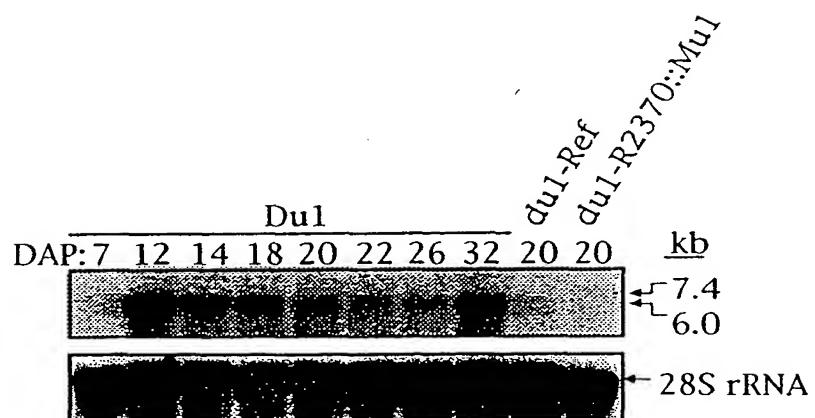


FIGURE 5A

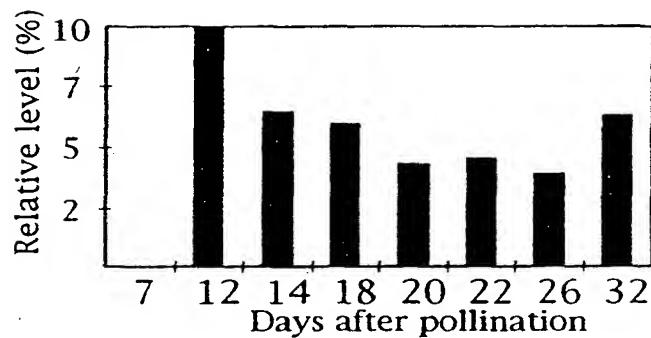


FIGURE 5B

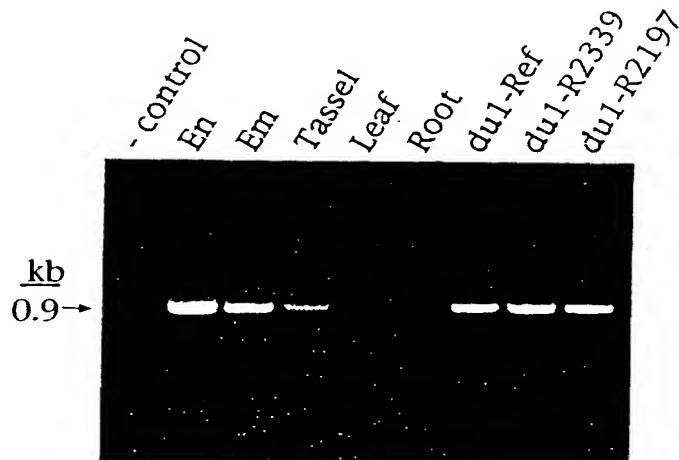


FIGURE 5C

Title: dull1 CODING FOR A NOVEL
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	MEMVLRQSPLCLRSGPPVLIFRPTVAGGGG	30
DU1	GTQSLLRTTRFARRRVIRCVVASPGCPNRKSRTASPNTVKVAAYSNYAPRLLVESSSSKKKS	89
DU1	EHDSSRHRREETIDTYNGLSSDAELTSNRDVEIEVDLQHISEEEELPGKVSIINASLGE	148
DU1	METVDEAEVEEDKFEVDTSGIVLRNAVAREVDPKDEHNNAKDVFVUDSSGTAPDNAAVEE	207
DU1	VVDEAEVEEDMVDVDILGLDLNNNATIEIDLMEALLENNFDVDSPGNASSGRTRYGGVDE	266
DU1	LGEUPSTSVDCTIAINGKRRSLKPPLPIVRFQEQEQQIVLTSIVDEEGLIASSCEEQGPVV	325
DU1	DYDKQEENSTAFAEQKQLTDDEPEEGISIVHEPEPNNDIVGSSKFLEQKQELDGSYKQD	384
DU1	RSTTGLHEQDQSVVSSHGQDKSIVGVPPQQIQYNDQSIAGSHRQDQSIAGAPEQIQSVAQ	443
DU1	YIKPNQSIIVGSCKQHELIIPPEPKKIESIISYNEIDQSIIVGSHKQDKSIVVSVPSEQIQSIV MDVFPPLHRSLSCTSVSNAITHLAKPILGFVSHGTIGLSVQSGSWRKDGMVTGVS	502 56
DU1	SHSKP N QSTVDSYRQAESIIIGVPEKVQSIITSYDKLDQSIIVGSLRDEPIISVPEKIQSIS FSICANESGRRRKVSTPRSQGSSPKGFVPRKPSGMSTQRKVQKNSGDKESKSTSTSKE	561 115
DU1	VHYTKPNQSIIVGLPKQQQSIIVH T EPKQSIDGFPKQDISIVG T SNEFQTQKQLAT T GTHD SEISNQKTVEARVETSDDDTKGW T RDHKFLEDEDIEINGSTKSISMSPVRSQQFMESEE	620 174
DU1	GLLMKGVEA A RETTSQKTEGDTLQATEN V DNLSQLQEG C KEADEITIEKINDEDLVMIE TGDDDKDAV K LNSKRSRSEESGFIIDS V REQSGSQGETNASSKGSHAVGTKLYEILQVD	679 233

FIGURE 6A-1

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DU1 SS3	EQKSIAMNEEQTIVTEEDIPMAKREIGIDKAKFILLSEESSWDENEVGIEADEQYF VEPQLKENNAGNEYKGPVASKLLEITKASDVFHESNEIDDUDINSFFKSDLIEEDE	738 292
DU1 SS3	VDETSMSTEQQIESPNDLDPQALWSMLQEIAEKNYSLGKLEFTYFDMKADSTIDLY PLAAGTVETCDSSLNLRLMEANLRRAIERLAEEENLLOGIRLECFBEMVKPDEDVEIF	797 351
DU1 SS3	FNRDLSAVANEEDPVLIKGAFLNKWPFETEKIHKEELAGDWWCCRLYIPRQAYRMDFVIF LNRGLSLTKNEDSVLIMGAENLWYRSEETTRIETHINGDWWMSCKIHVKPEAYRADEVIF	856 410
DU1 SS3	FNGHTTYVEFTNTNNDFVIQIESTIDENLFEDFLAEEKOREEFLANEPAERRROTDEQR ENGQDVKDNDGNDDESITVKGGQIIDEENELLEEKWMREJEKLAKEDQAERLAEAEORK	915 469
DU1 SS3	MFEPERADKADREVQAKIVEETKRNKTCNVLGIARAPVDNWIYEPIITGGCFAATVRLYNN TEAPEKAEIEEADQAQAKEEAAKKKVKTRDITWYIEPSEFKOEDKVRLYNN	974 528
DU1 SS3	INSRPLVHSTEWMEHGYNMWIDGLISFAERLVHHDKDCDWWFADWVMPERTYVLDWVFF KSECPPLSHAKDLMWHGCGYNMWIDGLSIVVKLUKSERIDCDWWMITYEVYIPDQALEFDWVE	1033 587
DU1 SS3	ADGPPGSABRNDDNNGGHDFHATLIPNMTFEEPYWMEEFORTYTRILOQERREREALKRA ADGPEPKHAIAYDNMHRQDFHATVPNHPEEYLWMEEHQIFKTLOQERREREALKRA	1092 646
DU1 SS3	ERNAKMKTAEMKEKTMRMFTLSQKHIVYTEPLETHAGTTINDLYNPSNTVLTGKPEWFR EKTLALKIETKERTMKSETLSOKHIVYTEPLEDQASSVMTYNNPANTVLTGKPEWFR	1151 705
DU1 SS3	CSENRWMPGCVLPQPKMVQAEENGSPALKATYVPRDAYMDDEVSESEFGTYDNRMCL CSENRWTHRLCPLBPKMSPAENGTHVATRYKVELDAYMDDEVSESEFGTFDNKSCM	1210 764
DU1 SS3	DYHIPVFGSIAKEPPMHIHVIAVEMAIAKVGGGDGVVTSLSRRAVQDIGHNVEVILPKY DYHIPVFGVIAKEPPMHIHVIAVEMAIAKVGGLGDVVTSLSRRAVODLNNVNDILLPKY	1269 823
DU1 SS3	GCTINLSNVRKVLQIHQSFSGGCSEINTWRCHVEGGIVYFILEPONGMFCVSYVYGRDDDR DCLKMNIVKDFRKNYFWGCCIEIKWFKVEGSLSYFILEPONGLESKGCVYCSNDGE	1328 882

FIGURE 6A-2

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DU1	RFGFFCRSALEFLLQ	GSSENTEIHCHDWSAPVAVIHKEPYAKSSR	ANP	VFTIHNLE	1387
SS3	RFGFFCRAALEFLLQ	GSEDEIHCHDWSAPVAVIHKEPYQTHCLSK	R	VFTIHNLE	941
DU1	FGAHHITGKAMRYODKATTVSNTY	SKEVSGHCAIMPHIGKFYGILNGIDPDIWDFYNDNF			1446
SS3	EGADDLIGRAMTNADKATTVSNTY	SPIYSQEVSGNPVIAPHIHKEFHGIVNGIDPDIWDFE			1000
DU1	FPVHYTQENVVEGKRAAKRALQ	KFGTQDMPMVGIVTRLTQKGHLIKHAJHRTLE			1505
SS3	TPPPYTSENVVEGKTAKEALQR	KLGLQDPLVGIITRTHQKGHLIKHAJHRTLE	T		1059
DU1	RNGQVLLGAPSAPDERI	QADFVNLANLHQVNHGQYRISLTYDEPLSHLIYAGSDFILVP			1564
SS3	RNGQVLLGAPSAPDERI	QONNEVNLANLHQSKYNDRARLQLTYDEPLSHLIYAGADEFILVB	T		1118
DU1	SIEFPCGLTQLVAMRYGHIP	IVRKTKGGIDTVFDVDNDKERARDRGLEPNGFSFGADS			1623
SS3	SIEFPCGLTQLVAMRYGSIE	IVRKTKGGIDTVFDVDHDKERAQOQGLEPNNGFSFGADA	T		1177
DU1	NGVDYALNRATSAWDP	RSWFHSICLKVMEQDWSNRPALDYELYRASKI			1674
SS3	GGVDYALNRATSAWDP	RSWENSLCKVMEODWSWNRPALDYELYHARKLE			1230

DU1 (SEQ ID NO: 12)

SS3 (SEQ ID NO: 35)

FIGURE 6A-3

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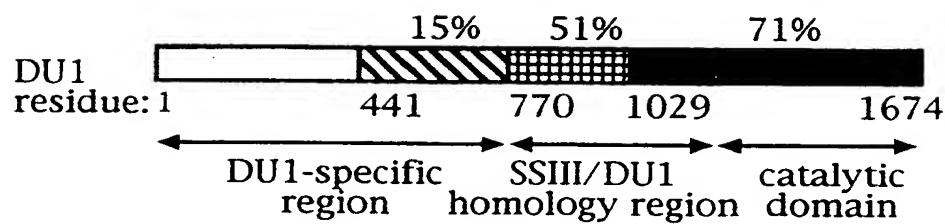


FIGURE 6B

Title: dnull CODING FOR A NOVEL
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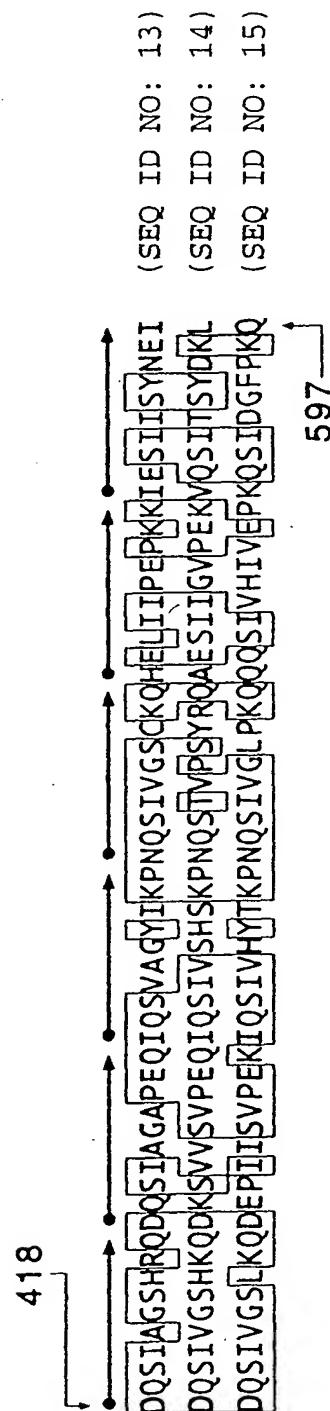


FIGURE 7A

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SBE-repeats in DU1:

478	DQSIVG SHKQ	487 (SEQ ID NO: 16)
538	DQSIVG S[K]Q	547 (SEQ ID NO: 17)
	↔	
	6/6 match	
448	NQSIVG SCKQ	457 (SEQ ID NO: 18)
568	NQSIVG LPKQ	577 (SEQ ID NO: 19)
418	DQSIA[G] SHRQ	427 (SEQ ID NO: 20)
428	DQSIA[G] APEQ	437 (SEQ ID NO: 21)
404	DKSIVG VPQQ	413 (SEQ ID NO: 22)
598	DLISIVG NEFQ	607 (SEQ ID NO: 23)
	↔	
	5/6 match	

FIGURE 7B-1

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SBEI family:

	529	*	*	*	553
Maize SBEI	K C I A Y A E S H	D Q S I V G	D K T I A F L L M D	(SEQ ID NO: 24)	
Pea SBEII	K C V S Y A E S H	D Q S I V G	D K T I A F L L M D	(SEQ ID NO: 25)	
Wheat SBEI	K C I A Y A E S H	D Q S I V G	D K T M A F L L M D	(SEQ ID NO: 26)	

6/6 match

SBEII family:

	572	*	*	*	596
Maize SBEIIa	K C V T Y C E S H	D Q A L V G	D K T I A F W L M D	(SEQ ID NO: 27)	
Maize SBEIIb	K C V T Y A E S H	D Q A L V G	D K T I A F W L M D	(SEQ ID NO: 28)	
Pea SBEI	K C V V Y C E S H	D Q A L V G	D K T L A F W L M D	(SEQ ID NO: 29)	

4/6 match

Glycogen branching enzymes:

	477	*	*	*	501
Yeast GLC3	K V V A Y C E S H	D Q A L V G	D K S L A F W L M D	(SEQ ID NO: 30)	
Human liver	K C I A Y A E S H	D Q A L V G	D K T L A F W L M D	(SEQ ID NO: 31)	

4/6 match

FIGURE 7B-2

Title: dull1 CODING FOR A NOVEL
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(SEQ ID NO: 32)
(SEQ ID NO: 33)
(SEQ ID NO: 34)

150 → [E] T V D E A E V E E D K -- F E V D T S G I V L R N V A V R
[E] V D P K D E H N A K D V F V V D S S G T A P D N A A V E
[E] V V D E A E V E E D M -- V D V D I L G L D L N N A T I ← 233

FIGURE 7C

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14119

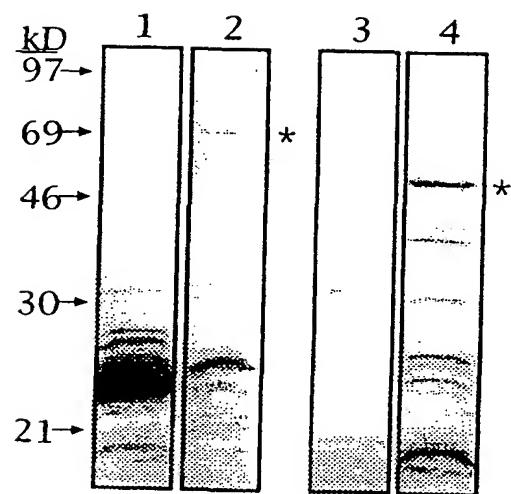


FIGURE 8

Title: dull1 CODING FOR A NOVEL
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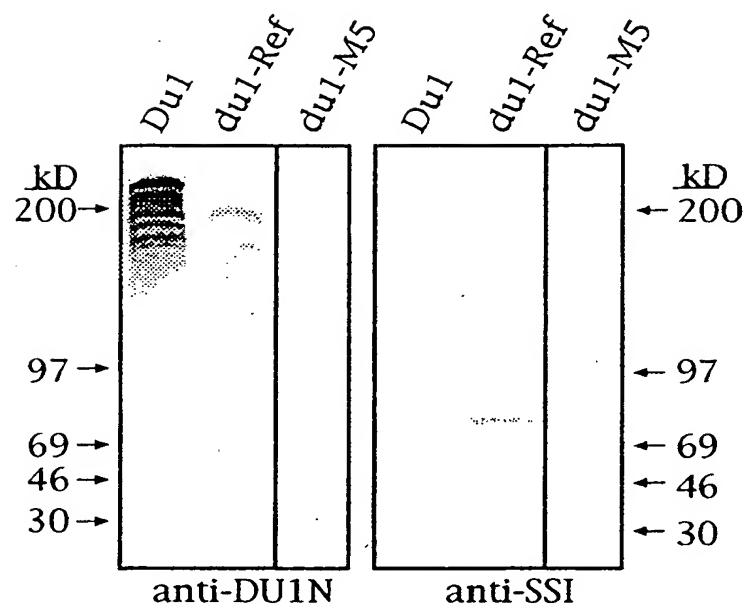


FIGURE 9A

Title: dull1 CODING FOR A NOVEL
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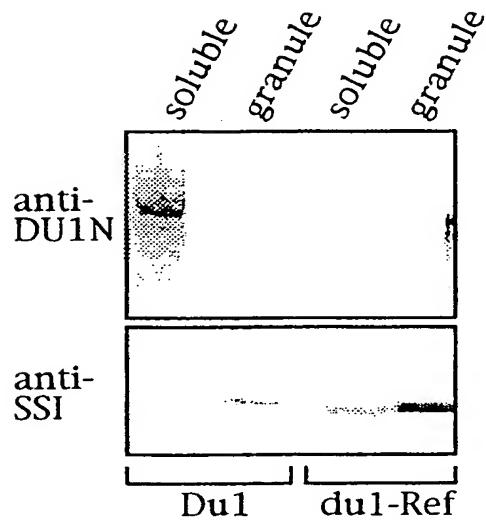


FIGURE 9B

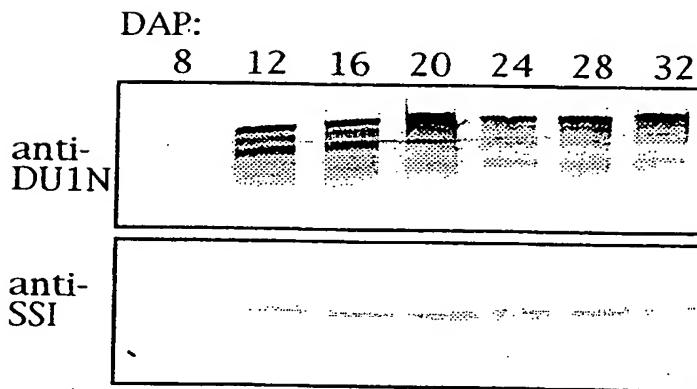


FIGURE 9C

Title: *dull1 CODING FOR A NOVEL
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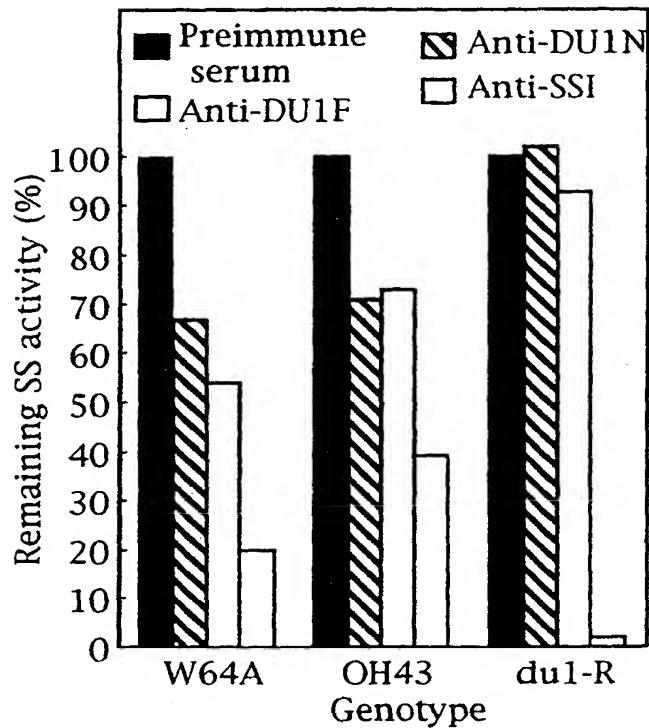


FIGURE 10

Title: dull1 CODING FOR A NOVEL
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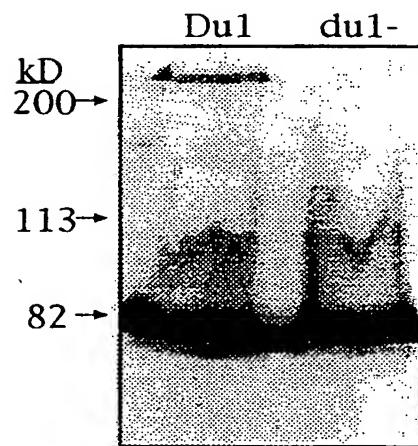


FIGURE 11A

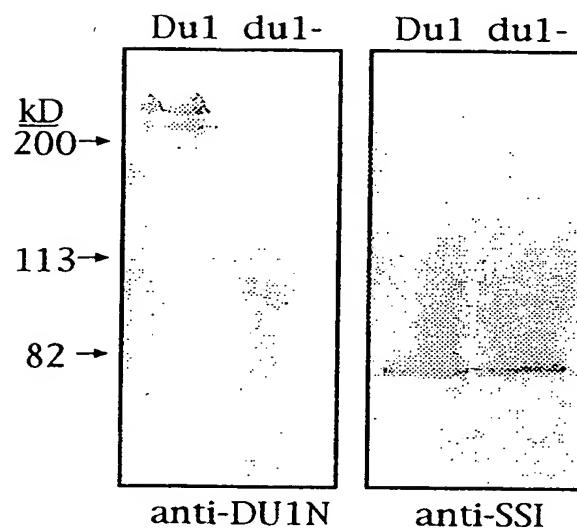


FIGURE 11B

Title: dull1 CODING FOR A NOVEL
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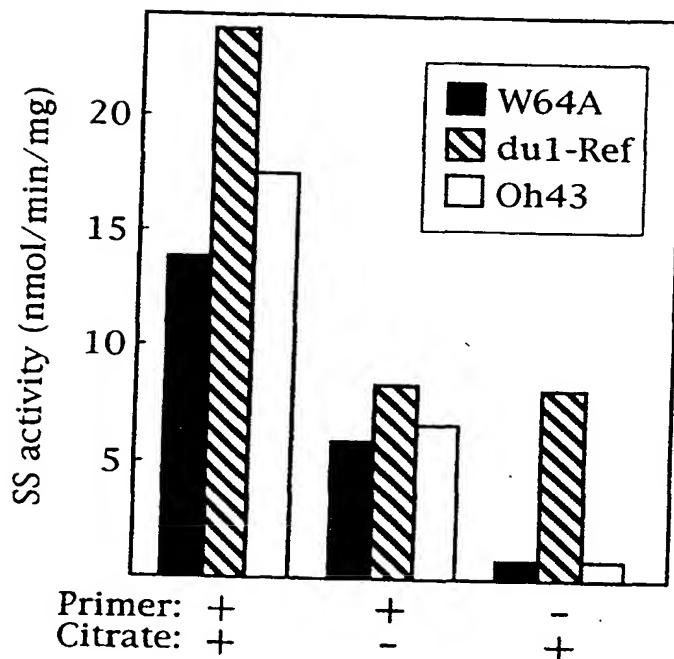


FIGURE 12